Table 1. *Factors Predictive of Neutrophil and Platelet Engraftment in Multivariate Analysis of Graft/Recipient Characteristics*

Multivariate Model	Neutrophil engraftment (p-value)	Platelet engraftment (p-value)
Pre-cryopreservation	CD34+ (0.0046)	Recipient ethnicity (0.0052)
	Recipient CMV (0.0138)	TNC (0.0173)
	CFU (0.0337)	CFU (0.0324)
	Unit Sex (0.0393)	
Post-thaw	CFU (<0.0001)	CFU (<0.0001)
	CD34 (0.0013)	HLA match (0.0117)
	HLA match (0.0065)	Recipient ethnicity (0.0135)
Overall	Post thaw CFU (<0.0001)	Recipient ethnicity (0.0063)
	Unit Sex (0.0131)	Post thaw CFU (0.002)
	HLA match (0.0186)	
	Post thaw CD34 (0.02)	

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STEM CELL RECOVERY FOLLOWING IMPLEMENTATION OF AN AUTOMATED CORD BLOOD PROCESSING SYSTEM IN A HIGH VOLUME LABORATORY

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Background: Many cord blood unit (CBU) processing facilities are transitioning to automated systems to standardize methods and decrease human error. The AutoXpress Platform™ (AXP™) is an automated, functionally closed, sterile CBU processing system. When placed within the AXP device and centrifuged, whole blood is separated into composite cell populations and the TNC fraction is separated and automatically delivered into a blow-molded freezing bag at a uniform volume of 21 mL. **Objective:** This study evaluated the use of the AXP system in a directed donation family cord blood bank, targeted at producing consistently high TNC and MNC recovery rates regardless of variability in collection volume. **Methods:** CBU were collected between 12/5/2006 and 2/24/2007 from 1414 consenting mothers who elected to preserve and bank CBU at Cord Blood Registry (CBR). Collection kits were provided at enrollment, and after delivery, cord blood was collected from the umbilical cord and transported to CBR's processing facility in Tucson, Arizona. During the study period, CBU arriving at the CBR laboratory were allocated to either ficoll or AXP processing based on the volume, age, and the degree of clotting. Units processed using AXP had a volume of 40–130 mL, an age of less than 48 hours since collection, and a clotting score of 0 to 2+ (based on an internal scale). TNC and MNC were measured both pre- and post-processing, using the Sysmex analyzer. **Results:** The mean age of CBU arriving at the laboratory was 23.59 hours, and the mean collection volume was 72.93 mL (±18.10 mL). The mean TNC count post-processing was 9.94×10^8, the TNC percent recovery was 96.19%, and the mean MNC percent recovery was 98.65%. Conclusions: AXP automated processing provides consistently high TNC and MNC recovery rates, which has important implications for stem cell dose if the sample is used in transplant. Because limited cell dose is frequently cited as an obstacle to CBU transplantation, processing results could impact the usability of each sample. Because family cord blood banks process all samples, regardless of collection volume, percent recovery becomes particularly important in evaluating the differences between processing centers. The AXP system yields the highest published cell recovery rate to date and can be easily integrated into a CBU processing center such that it decreases the labor and time required for CBU processing while maintaining MNC recovery of greater than 98%.

AXP Stem Cell Recovery

	Volume (mL)	Mean Post-Processing TNC ($\times 10^8$)	TNC Percent Recovery (%)	Mean Post-Processing MNC ($\times 10^8$)	MNC Percent Recovery (%)
Mean	72.93	9.94	96.19	4.05	98.65
Standard Deviation	18.10	4.43	11.87	1.59	9.16

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IgH GENE REARRANGEMENTS IN PBPC MONONUCLEAR CELLS DOES NOT INFLUENCE SURVIVAL OR RELAPSE FOLLOWING AUTOLOGOUS TRANSPLANTATION FOR B-CELL LYMPHOPROLIFERATIVE DISEASES

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Background: Relapsed disease remains a major obstacle following autologous hematopoietic stem cell transplantation (HSCT) for non-Hodgkin's lymphoma (NHL) and multiple myeloma (MM). Studies regarding the role of residual tumour cells collected in autografts in earlier relapse and reduced survival have been inconclusive. The impact of residual disease detected by sensitive molecular methods in autologous PBPCs remains uncertain and is addressed in this study. **Methods:** Patients undergoing autologous HSCT for NHL and MM at our institution between June 2001 and January 2006 were enrolled (n = 158). Aliquots of freshly collected PBPC collections were assessed for the presence of clonal IgH gene rearrangements using qualitative semi-nested PCR. Patients with detectable clonal IgH gene rearrangements were designated "positive" and compared with "negative" patients without detectable IgH gene rearrangements. Survival, progression-free survival, and time to next treatment were determined for all patients. All outcomes were compared using the method of Kaplan and Meier. **Results:** In comparison to patients with "positive" PBPC grafts, patients "negative" for detectable disease had no improvement in overall survival for MM ($p = 0.91$) and for NHL ($p = 0.82$). Further analysis based on tissue histology in patients with NHL revealed no significant difference in overall survival between patients with "positive" grafts compared with "negative" PBPC collections (aggressive histology NHL, $p = 0.74$; indolent NHL, $p = 0.29$). There was also no significant improvement in progression-free survival among patients with NHL ($p = 0.85$) or MM ($p = 0.91$). **Conclusion:** The use of autologous PBPCs "negative" for contaminating tumour cells does not lead to improved overall survival in MM or NHL. Furthermore, the absence of detectable clonal IgH rearrangements using sensitive PCR did not correlate with a reduction in progression-free survival. Our results suggest that disease relapse cannot be adequately explained by the reinfusion of PBPCs containing residual tumour cells. It is possible that high dose chemotherapy regimens used in autologous HSCT are not sufficiently eliminating residual tumour burden in some patients, including those with "negative" PBPC collections. Taken together, our results suggest that strategies aimed at removing tumour cells from autologous PBPC grafts in patients with MM and NHL may have marginal benefit.

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ENHANCED NATURAL KILLER (NK) AND NK T CELL ACTIVATION, EXPANSION AND CYTOKINE PROTEIN PRODUCTION FOLLOWING EX-VIVO ENGINEERING (EvE) OF PREVIOUSLY CRYOPRESERVED CORD BLOOD (CB): POTENTIAL FOR CB NK AND NK T CELLS IN ADOPTIVE CELLULAR IMMUNOTHERAPY (ACI)

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CB is limited by the absence of available donor effector cells following UCBT. We demonstrated the immaturity of CB by reduced